NATIONAL INSTITUTE OF OCEANOGRAPHY
Council of Scientific & Industrial Research (CSIR)

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No. IMP/ORV-AAS/EQ/2010 Dated: 02.11.2010

TENDER DOCUMENT FOR ACQUISITION OF ACOUSTIC SYSTEMS FOR *ORV SINDHU SADHANA*.

The above Systems shall consist of the following equipment:

Sr. No.	Name of the Equipment	Qty.	Ref. No.
1.	Hull Mounted Single Beam Dual Frequency Deep Sea Echo sounder	1 System	IMP/102(A)/EQ/2010
2.	Hull Mounted Single beam Dual Channel Shallow Water Echo Sounder	1 System	IMP/102/EQ/2010
3.	Hull Mounted Deep Water Multibeam Echo Sounder	1 System	IMP/181/EQ/2010
4.	Hull Mounted Shallow Water Multibeam Echo Sounder	1 System	IMP/181(A)/EQ/2010
5.	Hull Mounted Parametric Sonar System	1 System	IMP/180/EQ/2010

EARNEST MONEY DEPOSIT (EMD) … Rs.25 LAKHS
WARRANTY … 3 YEARS COMPREHENSIVE

CRITICAL DATES:

1. **Date of release of Tender : 04/11/2010**
2. **Date for Pre-Bid Meeting : 18/11/2010**
3. **Last Date of Bid Submission : 30/11/2010**
4. **Technical Bid Opening : 01/12/2010**

The National Institute of Oceanography, Goa intends to procure Shallow water multibeam echosounder, Deep water multibeam echosounder, hull mounted single beam dual channel shallow water echosounder, Deep water echosounder, Parametric sonar systems, which are required to be installed onboard the new Research Vessel Sindhu Sadhana. These equipments will be used extensively in geological & Geophysical surveys.

All the five equipment listed in this tender must be supplied by one supplier. The supplier must be a manufacturer of proven Deep Water Multibeam Echosounder System and Deep Sea Echosounder System. The supplier should be responsible for supply of all the above systems including spares, installation, systems integration, data management and provide a design/plan depicting the placement of transducers in the hull to achieve best results to the satisfaction of buyers. The supplier should provide comprehensive training to NIO Personnel as given in the technical specifications of each system.

General Arrangement Plan (GA Plan) of the vessel is attached for reference.

PART-A

TECHNICAL SPECIFICATIONS:

1.	***Technical specifications for Hull Mounted Single Beam Dual Frequency Deep Sea Echo sounder***

Sr.No	Parameters	Requirements
1.	Operational Frequency	12 KHz and any frequency between 18-24 KHz
2.	Operational Depth	at 12 KHz - 10000 Meters or better at 18 to 24 KHz - 3000 M or better
3.	Mounting of the receiver	Preferably on a 19" rack or bulkhead mounting
4.	Basic system	Latest stable Windows OS based, with standard serial, parallel and USB ports. Additional 6 serial ports for external interfaces such as heave sensor, SVP etc Drivers for all standard thermal recorders such as ULTRA, EPC etc., (as specified by the customer) on parallel port for hard copy output.
5.	Display	19" LCD monitor with 1280 X 1024 resolution
6.	Hard Disk Storage space	500 GB
7.	Additional Storage	DVD Read/Write Drive
8.	Printer	Separate 2 or 3 channel thermal recorder (ULTRA 120 type) to obtain real time hard copy of the data on 10"/12"

Sr.No	Parameters	Requirements
		width thermal paper or on film
9.	Recording paper rolls	25 No's – Standard rolls 25 No's – Thermal film based for permanent record To be supplied with the system
10.	Display Range on screen	Minimum: 10 meter to full screen, variable selection Maximum: Full range of the system The system to have manual and auto ranging for display.
11.	Sound Velocity	Manual feed: 1400 – 1600 m/sec Auto: Input from SVP
12.	Draft correction facility	0-99 M
13.	Depth Resolution	10 cm. or better.
14.	Depth accuracy	Pls specify in terms of % at various depths. For any depth accuracy should be better than 1% of water depth.
15.	Transmit Pulse length & Power	Auto and User selectable preferably, provide range of pulse length selection available Specify transmit Power
16.	Power Supply	Single phase AC 230 volts, 50 Hz and Optional DC (12-36 volts).
17.	Annotation	On chart paper and display Internal: selectable from Date, time, position, operational parameters, depth event no. etc. External: from RS232 port OR Ethernet input wherever applicable.
18.	Interfaces	**Input:** on RS 232 ports. Appropriate numbers to be provided on the system along with drivers etc. Facility to input NMEA data like - LAT, LONG, Date, Time from DGPS/GPS. - Sound velocity from SVP - Heave - External Annotator input. **Output:** • Depth data with navigation string stamp to internal data logger. • Ethernet output of the complete string including depth data to be available for logging on a centralized logging server similar to a MDM system. • RS232 depth data output for ECDIS, AWS, HYPACK systems • Raw analog output of echogram in 0 – 10 V DC scale at rear panel as input to NIO's echo integration and bottom classification system.
19.	Repeaters	4 repeaters - 19" LCD monitor displays in the locations specified by the NIO – approximate distance >50 M. Complete mounting kit as required for wall or table mount to be supplied.
20.	Pinger mode (Passive & Active)	The system to have 12 KHz Pinger operation capabilities for sampling operations.
21.	Multi-pulse	The system to have multi-pulse option for faster tracking

Sr.No	Parameters	Requirements
		of the bottom in the deep-water operations.
22.	Manuals, literature	a) All necessary details such as drawings, dimensions, weights and power consumption of the system/subsystems to be provided along with the quote to facilitate assessment related to space and power requirements. b) Two set of hard copy and two sets of soft copies of operators and servicing manuals. Complete with circuit description, detailed circuit diagrams for each board. The servicing manual to provide a detailed theoretical aspect of system design. Overall system, signal flow charts, fault-finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. **Complete documentation to be available to the owners before commencement of the installation process at yard.**
23.	Spares	Essential spares and consumables for one-year operation to be included in the offer. Comprehensive spares list to be quoted as an option. Standard tool kit must be provided
24.	Warranty period	Three years comprehensive warranty.
25.	Service during warranty	Manufacturer to have a competent servicing facility in India through their Indian representatives who will be responsible for all warranty repairs. Manufacturer to provide address and details of the technically competent Indian representatives.
26.	System synchronization	System to be suitable for external synchronization with other acoustic systems on board.
27.	Place and time of Delivery	Place - ABG Shipyard, Surat, India. Delivery period – 16-18 weeks Delivery of the system is linked with the Shipyard requirements. Exact delivery date will be informed at the time of placement of the order.
28.	Installation	During all stages of installation at the yard, the manufacturer's engineer will ensure that proper installation procedures are followed by the yard. Manufacturer will provide all details needed for installation at yard including scope of supply from the yard. Necessary structural requirements such as gland packing, pipes, different types of cables, cable terminations etc., and all other items as per requirements are supplied and used for installation of the equipment. Any LAN OR RS232 lines required during installation to be specified giving all details including type, size and lengths etc. This is also applicable to other cables from transceiver room to Lab space, LAB to all the repeater/ Helmsmen displays shown in the GA plan. GA plan will be part of the tender document. The manufacturer may recommend for any

Sr.No	Parameters	Requirements
		change for appropriate location on the GA plan provided in the transducer location area to the locations shown by NIO in the GA plan. Acceptance by NIO representative to be obtained by the manufacturer for any changes.
29.	Training	At factory, detailed theoretical training on Installation, servicing, maintenance of system for 5 working days for 2 NIO engineers preferably on the system for NIO. This may include one day practical on boat/ship. At Sea Trials, all aspects of calibration and operational training for NIO Engineers and surveyors and servicing at component/board level repairs to be given. The duration of training will be 5 working days. The training should be provided by a competent engineer who is well versed with complete system and will be able to answer all possible related questioners from NIO engineers.
30.	Harbor Acceptance Test (HAT)	On completion of the installation process, manufacturer will conduct a Harbor Acceptance Test (HAT) of the system in presence of the owner's representatives. Manufacturer's representative to be present at the time of installation process to ensure that all due precautions are taken by the yard in providing all the material of the quality specified by the manufacturer in his yard's scope of supply. Any negligence or discrepancy on part of yard during the course of installation may be brought to the notice of owner's representatives in a written report.
31.	Sea Acceptance Test	On completion of ship's conversion by yard the manufacturer will conduct the Sea Acceptance Test (SAT) of the system, demonstrate working of the system as per the specifications and terms signed in agreement document. The system will be accepted only after successful completion of sea trials and demonstration of the system capabilities. Any deviation in the performance of the equipment will be set right by the manufacturer within a mutually agreed period. Warranty of the system will start on completion of the acceptance of the sea trials.
32.	Tender offer rejection criteria.	Tender offer to cover all technical requirements showing documentary evidence of the technique and methods applied for achieving various parameters as in the tender specifications. Mere compliance statement without technical documentary evidence may result in rejection of the offer.
33.	User List	Manufacturer to supply list of users who have installed such system during last three years along with copy of system acceptance document by the users.
34.	**Other condition/s**	**Compliance of all parameters will be verified during installation and trials. Any shortcomings will be documented and manufacturer has to compensate for the loss per default by way of penalties. (1% of total value to a maximum of 10%)**

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2.	*Technical Specificatioons for Hull Mounted Single beam Dual Channel Shallow Water Echo Sounder*

Sr.No	Parameters	Requirements
1	Frequencies of operation	Between 33 to 38 KHz, and between 200 to 240 KHz, dual channel selectable with simultaneous operation.
2	Operational Depth range	0.5 - 1000 m @ 33 to 38 KHz (operation to be guaranteed) 0.2 - 200 m @ 200 to 240 kHz (operation to be guaranteed)
3	Mounting of the receiver	Preferably on a 19” rack or bulkhead mounting
4	Basic operating system	Latest stable Windows OS based, with standard serial, parallel and USB ports. Additional 6 serial ports for external interfaces such as heave sensor, SVP etc Drivers for all standard thermal recorders such as ULTRA, EPC etc., (as specified by the customer) on parallel port for hard copy.
5	Main Display	19” LCD monitor with 1280 X 1024 resolution
6	Hard Disk Storage space	500 GB
7	Additional Storage	DVD Read/Write Drive
8	Printer	Separate (not inbuilt) A 2 or 3 channel thermal recorder (ULTRA 120 type) to obtain real time hard copy of the data on 10”/12” width preferred thermal paper or on film
9	Recording paper rolls	25 No’s – Standard rolls 25 No’s – Thermal film based for permanent record To be supplied with the system
10	Display Range on screen	Minimum: 05 meter to full screen, variable selection Maximum: Full operational depth range The system to have manual and auto ranging facility for display and recording
11	Sound Velocity	Manual feed: 1400 – 1600 m/sec Auto: Input from SVP (RS 232 I/P)
12	Draft correction facility	0-99 M
13	Depth Resolution	1 cm or better
14	Depth accuracy	Pleases specify in terms of % at various depth ranges and for the frequency used. For any depth accuracy should be better than 1% of water depth.
15	Transmit Pulse length and Power	Auto and user selectable, provide range selection and transmit power
16	Power Supply	Single phase AC 230 volts, 50 HZ and DC (12-36 volts).
17	Annotation	On chart paper and display Internal: selectable from date, time, position,

Sr.No	Parameters	Requirements
		operational parameters, depth, event no. etc. External: from RS232 port OR Ethernet input wherever applicable.
18	Interfaces	**Input:** on RS 232 ports. Appropriate numbers to be provided on the system along with drivers etc. Facility to input NMEA data like LAT, LONG, Date, Time from DGPS/GPS. Sound velocity from SVP Heave External Annotator input. **Output:** Depth data with navigation string stamp to internal data logger. Ethernet output of the complete string including depth data to be available for logging on a centralized logging server similar to a MDM system. RS232 depth data output for ECDIS, AWS, HYPACK systems Raw analog output of echogram in 0 – 10 V DC scale at rear panel as input to NIO's echo integration and bottom classification system.
19	Repeaters	4 repeaters - 19" LCD monitor displays in the locations specified by the NIO, approximate distance >50 M. Complete mounting kit as required for wall or table mount to be supplied.
20	Manuals, literature	a) All necessary details such as drawings, dimensions, weights and power consumption of the system/subsystems to be provided along with the quote to facilitate assessment related to space and power requirements. b) Two set of hard copy and two sets of soft copies of operators and servicing manuals. Complete with circuit description, detailed circuit diagrams for each board. The servicing manual to provide a detailed theoretical aspect of system design. Overall system, signal flow charts, fault-finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. **Complete documentation to be made available to the owners before commencement of the installation process at yard.**
21	Spares	Essential spares and consumables for one-year operation to be included in the offer. Comprehensive spares list to be quoted as an option. Standard tool kit must be provided
22	Service during warranty	Manufacturer to have a competent servicing facility in India through their Indian representatives who will be responsible for all warranty repairs. Manufacturer to provide address and details of the technically competent Indian representatives.

Sr.No	Parameters	Requirements
23	Warranty period	Three years comprehensive warranty.
24	System synchronization	System to be suitable for external synchronization with other acoustic systems on board.
25	Place and time of Delivery	Place - ABG Shipyard, Surat, India. Delivery period – 16-18 weeks Delivery of the system is linked with the Shipyard requirements. Exact delivery date will be informed at the time of placement of the order.
26	Installation	During all stages of the installation at the yard the manufacturer's engineer will ensure that proper installation procedures are followed by the yard. Manufacturer will provide all details needed for installation at yard including scope of supply from the yard. Necessary installation items like gland packing, pipes, different types of cables, cable terminations etc., are supplied and used for installation of the equipment. Any LAN OR RS232 lines required during installation to be specified giving all details including type, size and lengths etc. This is also applicable to other cables from transceiver room to Lab space, LAB to all the repeater displays. GA plan will be part of the tender document. The manufacturer may recommend for any change for appropriate location on the GA plan provided in the transducer location area to the locations shown by NIO in the GA plan. Acceptance by NIO representative to be obtained by the manufacturer for any changes.
27	Training	At factory, detailed theoretical training on Installation, servicing, maintenance of system for 5 working days for 2 NIO engineers preferably on the system for NIO. This may include one day practical on boat/ship. At Sea Trials, all aspects of calibration and operational training for NIO Engineers and surveyors and servicing at component/board level repairs to be given. The duration of training will be 5 working days. The training should be provided by a competent engineer who is well versed with complete system and will be able to answer all possible related questioners from NIO engineers.
28	Harbor Acceptance Test	On completion of the installation process, manufacturer will conduct a Harbor acceptance test (HAT) of the system in presence of the owner's representatives. Manufacturer's representative to be present at the time of installation process to ensure that all due precautions are taken by the yard in providing all the material of the quality specified by the manufacturer in his yard's scope of supply. Any negligence or discrepancy on part of yard during the course of installation may be brought to the notice

Sr.No	Parameters	Requirements
		of owner's representatives.
29	Sea Acceptance Test	On completion of ship's conversion by yard the manufacturer will conduct the Sea Acceptance Test (SAT) of the system, demonstrate working of the system as per the specifications and terms signed in agreement document. The system will be accepted only after successful completion of sea trials and demonstration of the system capabilities. Any deviation in the performance of the equipment will be set right by the manufacturer within a mutually agreed period. Warranty of the system will start on completion of the acceptance of the sea trials.
30	Tender offer rejection criteria.	Tender offer to cover all technical requirements showing documentary evidence of the technique and methods applied for achieving various parameters as in the tender specifications. Mere compliance statement without technical documentary evidence may result in rejection of the offer.
31	User List	Manufacturer to supply list of users who have installed such system during last three years along with copy of system acceptance document by the users.
32	**Other condition/s**	**Compliance of all parameters will be verified during installation and trials. Any shortcomings will be documented and manufacturer has to compensate for the loss per default by way of penalties. (1% of total value to a maximum of 10%)**

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3.	*Technical Specifications for Hull Mounted Deep Water Multibeam Echo Sounder*

The System is required to be installed onboard the Indian Research Vessel proposed new ORV for NIO and to be used for swath bathymetric surveys. The system should be capable of operating from shallow water to deepwater (~10000 m) and should be complaint to IHO standards. The system should include position fixing by DGPS (satellite based corrections), motion sensors, heading sensor, sound velocity sensor (for near ship's-keel measurement), data acquisition system, post-processing system (hardware and software for onboard and shore installations), accessories and all related peripheral systems.

NOTE:

1. **Kindly note that some of the details sought in the technical specifications as mentioned below cannot be quantified in absolute numbers. Merit of a specific point in such cases will be considered based on complete and**

detailed explanation by the makers of the system and based on the advantages of their explanation of the technique over their competitors.

2. **It has been observed with experience of operating a shallow water multibeam system for the past 4 years with an arc OR circular shape transducer array, the outer beams pose lot of problems in Indian waters. Also an arc OR a circular array installed along with a deep water multibeam flat transducer array and other sonar system flat transducers like parametric sonar and echosounders, in a flush mount or gondola type installation configuration would protrude out below the other transducer(s) arrays. This may create a flow noise problem and would have a chance of entanglement with fishing nets in the shallow navigation areas. Protruding array also increases the draft of the vessel. In view of these disadvantages NIO will not opt for arc OR circular type of array for its flush mount or gondola type transducer installation and would prefer only flat type array. This would enable reducing outer beam problems; enable seamless flush or gondola configuration transducer installation along with other sonar system transducers mentioned above.**

3. **In view of having same data acquisition and processing platform, which would allow a seamless fusion of data collected using shallow and deepwater multibeam systems, a better data format compatibility, ease of handling large volumes of data to generate bathymetry maps of overlapping shallow and deepwater survey areas, both shallow and deep water multibeam systems should be from the same OEM.**

System Configuration:

1. Principal operating frequency	12 to 15 kHz
2. Depth Capability	More than 10000 meters. This is depth of ocean and not the slant range. (Center beam)
3. Beam width	1° x 2° (along and across the track)
4. No. of Beams	More than 200. Mention what is the actual number of hard beams generated during beam forming and the process used to increase the number of beams (soft beams). These details should be part of your technical offer.
5. Angular Swath	Up to 140°, details of coverage versus depth to be provided for 1° x 2° configuration.
6. Swath Coverage in soft sediment (mud) conditions	At least 2000meters at 500 meters water depth At least 5000meters at 1000 meters water depth At least 18000meters at 3000 meters water depth At least 24000meters at 6000 meters water depth
7. Operational Environmental Limits	Roll: +/- 15° Pitch: +/- 10° Yaw: +/- 10° Sea state: up to 4 Temperature: 5° - 40° C

	Humidity: 10% to 80% non-condensing Ship's speed: up to 12 knots

Signal Transmission Requirements:

8. Maximum Source Level	Mention maximum dB source levels achieved by your system and confirm if these transmission levels are sufficient for operation to full ocean depths.
9. Side lobe suppression	-25 dB OR better. Details of the technique employed to be provided.
10. Near field corrections	To be employed for shallow water measurements. Details of the process employed for this correction to be provided.
11. Pulse Length	2 to 15 ms in maximum possible steps. Provide details
12. Motion Compensation	Essential use of active attitude parameters. Pitch and Yaw for transmission. Roll pitch and Yaw for reception. The vendor shall provide full technical details.
13. Multi-ping/Dual swath ping Facility	Required. Provide details of increase in the data coverage density.
14. Coverage	100% bottom ensonification (without gaps) should be ensured with the real-time active motion compensation (Roll, Pitch, Yaw)/stabilization of transmit beams for all depth and pulse widths at 12 knots vessel speed.
15. Beam Pattern	All technical details to be provided as a part of technical document..
16. Transmission Type	Coded sector Scan/Swept beam OR both technique. Provide details of implementation of the technique used in your system. These details should be part of your technical offer.
17. Transmission pulse type	Both CW and Chirped pulsed transmission to be available. Please provide details. These details should be part of your technical offer.

Data Reception Requirements:

18. Receiver gain details	All technical details regarding process of Pre-amplification, TVG/AGC, bandpass filter details from normal incidence to outermost angles for all depth ranges etc. used within the quoted system to be provided. These details should be part of your technical offer.
19. Beam forming	Array Extrapolation is preferred. Detailed description of high-resolution techniques used in beam forming, if adapted in your system needs to be provided. Also mention if your method has any advantage over the systems manufactured by others. These details should be part of your technical offer.
20. A/D Conversion	Minimum 12 bits. If there are any special techniques used for improving the resolution of the received signal,

	same should be presented with technical bid.
21. Dynamic Range	All technical details to be provided.
22. Raw data Storage	This should be in addition to the routine data collection: - Raw echo amplitude time slice data from transducers / hydrophones staves along with raw depth data and auxiliary sensor data storing with necessary interface and on a separate storage device.

Bathymetry:

23. Bottom Detection	Technique should be explained giving algorithms(s) details. The system performance should not degrade in different topographic domains like seamounts/slopes and high- resolution data should be ensured. Any real time data cleaning carried out should be explained.
24. Beam Spacing	Options for equiangular and equidistance should be available.
25. Motion Sensor Compensation	Active use of the Roll (+/-15°), Pitch (+/-10°), Yaw (+/- 10°).
26. Depth Resolution	Better than 0.5m at 11,000m. Provide details of the capability of system you are quoting in this offer. Better accuracies will have more weightage. Also depth accuracy to be provided as per the angular reception angle.
27. Interface	Serial interface for ship motion data, gyro compass data, navigation data, surface sound velocity, sound velocity profile, interface for online gravity and magnetic data from existing system onboard. A LAN interface for data transfer and connectivity to ship's LAN system should be available.
28. Operator Station	Complete data acquisition package on a stable WINDOWS OS platform including hardware for processing, display, mass storage on latest SCSI Hard discs and removable media (Exabyte and DVD), 10/100 LAN etc., System should be capable of holding at least one month's data under data collection rate. A blue ray recording system for storage of data will also be part of the operator station.
29. Data Acquisition	The data acquisition system should support survey planning and different datum/projections with a background of electronic navigation charts (ENC) System should support overlaying standard graphic files. Data from all supporting sensors in non-destructive raw data format should be provided. Real time motion correction, Time tagging to 1 millisecond, Online event log for Hydrographic tracking to be provided. A large data storage device of not less 1 terabyte should be part of the system configuration. Real time transfer of survey data to an external Image

	processing/mass storage device shall be provided.
30. Quality Control	Online quality control must assess the quality of the data in real time. Among the tools to be provided are Standard deviations of bathymetric data and Coverage plot. Technique used to be described in detail in the offer and should also reflect in the manual.
31. Online Monitoring	Two additional Helmsmen displays (Industrial type monitors) at specified locations on the ship, Optional-online track plotter for coverage.

32. Power Supply	230 Volts at 50Hz
33. Post-Processing System	Two post processing systems (one onboard and one for land-lab use) with the following capabilities: - Data cleaning, DTM generation, Data thinning, grid generation and presentation graphics, CAD Compatible output. - Full system with hardware and peripherals like printer, A0 plotter, Exabyte, DVD etc. should be provided. The system should be on latest Windows OS. - Data should be exportable in an open data format and compatible to standard commercial/ freeware (e.g. GMT or MB-system) to carry out post processing.
34. Datagram source	Should be provided
35. Side Scan Imagery & backscatter data.	16-bit or better backscatter data will be used to generate side scan imagery with minimum 7000 samples or more per ping in real time with slant range correction. On post processing, geo-referencing, Mosaicing, Image enhancement, bathymetric draping, and data output optionally in XTF or SEG-Y format should be available. Provide details on number of pixels used per ping to generate the SSS and backscatter imagery. These details should be part of your technical offer.
36. Sea-Floor Classification: Software	Utilizing above mentioned backscatter data, this may be optionally quoted
37. Angular Backscatter strength:	Parameters for backscatter strength computations like signal gain terms (transmission and reception)—the pre-amplifier gain, transducer matching circuit aspects, beam forming gain, band pass filter gain and time varied gain (TVG) employed within the system should be provided. Details about special normalization techniques: Lambert's law (employed, if any) should also be provided.
38. Backscatter Processing:	Software to compute near absolute backscatter strength vs. incidence angle (with all gain corrections), sea-floor slope corrections, and sea-floor ensonification area normalization. This may be optionally quoted.

39. Water column imaging:	To acquire acoustic data from water column to correlate with biomass and related deep scattering layer (DSL).
40. Signal Synchronization:	The system should generate synchronization signal to control pinging of the other acoustic sensors like DS echosounder, SBP, Parametric sonar SW-water Echosounder should be provided with the system..

Sensors:

41.Positioning:	12-channel marine GPS receiver capable of providing position accuracy better than 2.0m in DGPS mode through out the survey area (from shore to about 2000 nm offshore from Indian Coast) at 1Hz positioning rate. The system shall have DGPS correction link for a period of three years from a reputed satellite based service provider (all costs inclusive). The system should have provision to provide navigation data strings to number of systems i.e. to deep & shallow water MB systems, parametric sonar system, deep & shallow water echo sounders, motion reference sensor and other 3 to 4 sonar systems installed on board the vessel. The system will also provide 1 pps signal for time synchronization to all the above mentioned systems wherever required. Positioning system will also provide heading reference to the multibeam sonar systems and parametric sonar.
42. Motion and Heading sensors:	Manufacturer shall provide and integrate suitable systems for satisfactory performance. This should also support the chirp system operational mode by providing all the three axes velocity components. The system should be able to provide motion (roll, pitch, heave & yaw) and heading data to deep & shallow water MB systems, parametric sonar system and a SBP system. Necessary buffered outputs therefore should be made possible with additional hardware if any integrated in to this system. The system should be capable providing motion sensor parameters to parametric sonar and heave compensation signal to deep & shallow water echo sounders.
43. Sound Velocity at the keel:	Manufacturer shall provide a suitable on line system and integrate the same with both deep and shallow & deep water multibeam systems and parametric sonar system.
44. Sound Velocity Profiler:	Manufacturer shall provide for sound velocity profiling system/probe up to 6000 meters depth capability- Details and break-up price to be quoted separately as an option.
45. File server/Data management	Supplier will provide an appropriate file server/data management system, which will be interfaced to the ship's network system. This server will act as central data-logging facility for data generated from both multibeam systems, parametric sonar and both echo sounder systems. The to have adequate safety

	measures and protections safeguard the data and to prevent use by any non-authorized personal
46. Navigation server and administrator	To cater to navigation data requirements input from the navigation system as mentioned earlier, the supplier shall provide a navigation server and administrator. This will provide facility to connect/interface more devices/systems that need navigation input. At least 6 extra RS232 ports to connect additional devices/systems to the navigation server, other than navigational strings used for shallow & deep multibeam systems, shallow & deep echosounder systems and parametric sonar system should be made available. Navigational server will be housed in the data acquisition laboratory.

Other Requirements:

47. System synchronization	The system to be suitable for external synchronization with other acoustic systems on board.
48. Dimension details	Please provide complete physical dimensional details of each unit covered under the scope of delivery. This should include length, breadth, height of each unit, weight of each unit, input A/C power rating for each unit and total power requirement for entire system.
49. Place and time of Delivery	Place - ABG Shipyard, Surat, India. Delivery period – 16-18 weeks Delivery of the system is linked with the Shipyard requirements. Exact delivery date will be informed at the time of placement of the order.
50. Installation	During all stages of the installation at the yard the manufacturer's engineer will ensure proper installation procedures are followed by the yard. Manufacturer will provide all details needed for the installation at yard including scope of supply from the yard like necessary structural requirements like gland packing, pipes, different types of cables, cable terminations etc and shall ensure that all items as per requirements are supplied and used for installation of the equipment. Any LAN lines OR RS232 lines required during installation to be specified giving all details including type, size and lengths of such cables. This is also applicable to any other cables from transceiver room to Lab space, Lab space to all the repeater/ Helmsmen displays shown in the GA plan. GA plan will be a part of the tender document. The manufacturer to recommend for any change for appropriate location on the GA plan provided in the transducer location area to the locations shown by NIO in the GA plan.
51. Spares	Some of the minimum essential spares should be part of

	the equipment. List of such spares that will be part of delivery should be listed clearly. Other comprehensive list of spares required for 3 year operations to be quoted separately.
52. Manuals, literature	4 copies of operators manual, servicing manual complete with circuit description, detailed circuit diagrams for each board and overall system, signal flow charts, fault finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. This is a mandatory requirement. If detailed circuit diagrams are not included in the service manual as explained above, a penalty will levied to the supplier, which will be part of the supply agreement document.
53. Factory Acceptance Test (FAT)	Successful bidder will arrange for the FAT conducted in presences of 3 NIO Engineer/Scientist prior to the shipment of the system for installation. Manufacturer shall demonstrate complete and satisfactory working of each module of all the sub-systems, related sensors and of the entire integrated system at their manufacturing premises during FAT. FAT is expected to be for duration 5 to 7 days to enable proper inspection of the system before delivery.
54. Harbor Acceptance Test (HAT)	On completion of the complete installation process, the manufacturer will conduct the Harbor acceptance test (HAT) of the system in presence of the owner's representatives. Manufacturer's representative present at the time of installation process to ensure that all due precautions are taken by the yard in providing all the material of the quality specified by the manufacturer in his yard's scope of supply. Any negligence or discrepancy on the part of yard during the course of installation process may be brought to the notice of owner's representatives at Yard.
55. Sea Acceptance Test (SAT)	On completion of ship's construction by yard the manufacturer will conduct the Sea Acceptance Test (SAT) of the system and demonstrate working of the system as per the specifications and the agreed terms signed in an agreement document. The system will be accepted only after successful completion of sea trials and demonstration of the system capabilities. Any deviation in the performance of the equipment will be set right by the manufacturer within a period mutually agreed. Warranty of the system will start on completion of the acceptance of the sea trials.
56. Training to NIO Engineers and Scientist	An operation, maintenance, servicing training on the main system and complete post-processing procedures shall be provided by the manufacturer for period not less than 5 working weeks for 4 NIO personal at the manufacturer's premises. A comprehensive training

	programme schedule will be drawn by NIO in consultation with successful bidder.
57. Warranty	3 years comprehensive warranty

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4.	*Technical Specifications for Hull Mounted Shallow Water Multibeam Echo Sounder*

The Systems are required to be installed onboard Indian Research Vessel for NIO and to be used for swath bathymetric surveys. This system should be capable of operating up to 600 meters water depth and should be compliant to IHO (S-44) standards. The system should include position fixing by DGPS (satellite linked), motion sensors, heading sensors, sound velocity sensor (for near ship's-keel measurement, data acquisitions system, post-processing system (hardware and software for onboard and onshore processing), accessories and all related peripheral systems.

NOTE:

1. **Kindly note that some of the details sought in the technical specifications as mentioned below cannot be quantified in absolute numbers. Merit of a specific point in such cases will be considered based on complete and detailed explanation by the makers of the system and based on the advantages of their explanation of the technique over their competitors.**

2. **It has been observed with experience of operating a shallow water multibeam system for past 4 years with an arc OR circular shape transducer array, the outer beams pose lot of problems in Indian waters. Also an arc OR a circular array installed along with a deep water multibeam flat transducer array and other sonar system flat transducers like parametric sonar and echosounders, in a flush mount or gondola type installation configuration would protrude out below the other transducer(s) arrays. This may create a flow noise problem and would have a chance of entanglement with fishing nets in the shallow navigation areas. Protruding array also increases the draft of the vessel. In view of these disadvantages NIO will not opt for arc OR circular type of array for its flush mount or gondola type transducer installation and would prefer only flat type array. This would enable reducing outer beam problems; enable seamless flush or gondola configuration transducer installation along with other sonar system transducers mentioned above.**

3. **In view of having same data acquisition and processing platform, which would allow a seamless fusion of data collected using shallow and deepwater multibeam systems, a better data format compatibility, ease of handling large volumes of data to generate bathymetry maps of overlapping shallow and deepwater survey areas, both shallow and deep water multibeam systems should be from the same OEM.**

1.Principal Operating Frequency	Varying frequency range for ensonification coding in different sectors/directions from nadir - ~ 75KHz to 110 kHz
2. Depth Capability	Up to 600 meters. This is depth of ocean and not the slant range. Please specify what would be the extended depth range capability in case of a Chirp transmission source.
3. Beam Width	1° X 2° deg.
4. Beam Pattern	All technical details to be provided.
5. No. of Beams per ping	At least 400 beams
6. Angular Swath	Up to 150 deg.
7. Operational Environment Limits	Roll: +/- 15° Pitch: +/- 10° Yaw: +/- 5° Sea state: up to 4 Temperature: 5° -40° C Humidity: 10% to 80% non-condensing Ship's speed: up to 10 knots
8. Swath Coverage in soft sediment (mud) conditions	At least 250meters at 50 meters water depth At least 600meters at 100 meters water depth At least 1500meters between 250 and 1000 meters water depth
9. Operational Limits	Temperature: up to 40 deg. C Sea state: up to 5 Ship's Speed: up to 12 knots
10. Transmission Source Level	~220 dB 1 micro Pa/m or better
11. Transmission Pulse Length & Type used in the system.	0.1 ms to 2ms in case of CW pulse. All technical details to be provided. Both CW and Chirped pulsed transmission to be available. These details should be part of your technical offer.
12. Transmission Side Lobe Level	Minimum –25 dB or better. All technical details to be provided.
13.Motion Compensation	Essential use of active attitude parameters. Pitch and Yaw for transmission. Roll pitch and Yaw for reception. The vendor shall provide full technical details.

14. Bottom Coverage	100% bottom ensonification (without gaps) should be ensured with the real-time active motion compensation (Roll, Pitch, Yaw)/stabilization of transmit beams for all depth and pulse widths at 10 knots vessel speed.
15. Transmission Beam Pattern	All technical details to be provided.
16. Transmission Type	Coded sectors Scan/Swept beam technique. Provide details of implementation of the technique used in your system. These details should be part of your technical offer.
17. Ping rate	Details of ping rate at 100 to 500-meter water depth to be specified. Maximum shall be preferred. It should be 20 pings per second or better.
18. Receiver gain details	All technical details regarding process of Pre-amplification, TVG/AGC, bandpass filter details from normal incidence to outermost angles for all depth ranges etc. used within the quoted system to be provided. These details should be part of your technical offer.
19. Reception Technical Specifications	Details of Beam forming technique employed and across-track Beam Pattern indicating the side-lobe level should be specified. Signal A/D conversion and Dynamic range details should be provided. Detailed description of high-resolution techniques used in beam forming, if adapted in your system needs to be provided. These details should be part of your technical offer.
20. Raw data Storage	This should be in addition to the routine data collection. Raw echo amplitude time slice data from transducers/hydrophones staves along with raw depth data and auxiliary sensors data storing with necessary interface and separate storage should be provided.
21. Bottom Detection	Technique employed should be explained giving the details of algorithm(s). The system performance should not degrade in different topographic domains like seamounts/slopes and high- resolution data should be ensured. Any real time data cleaning carried out should be explained.
22. Range Resolution	Resolution for the range 100-600m, at 100 m intervals to be provided. Also depth accuracy to be provided as per the angular reception angle.

23. Interface	Serial interface for ship motion data, gyro compass Data, navigation data, surface sound velocity and sound velocity profile data to be provided. LAN interface for data transfer and connectivity to ship's LAN and for LAN connection within sub-systems.
24. Operator station	Complete data acquisition package including hardware for processing, display, mass storage on latest SCSI hard disc, removable media and LAN should be provided. System should be capable of holding at least 10 days data.
25. Data acquisition	The data acquisition system should support survey planning and different datum/projections with a background of electronic navigation charts (ENC) System should support overlaying standard graphic files. Data from all supporting sensors in non-destructive raw data format should be provided. Real time motion correction, Time tagging to 1 millisecond, Online event log for Hydrographic tracking to be provided. A large data storage device of not less 1 terabyte should be part of the system configuration. Real time transfer of survey data to an external Image processing/mass storage device shall be provided. Details of online quality control measures employed should be provided.
26. Online Monitoring	One additional Helmsman display for multi-beam system to be supplied.
27. Quality Control	Online quality control must assess the quality of the data in real time. Among the tools to be provided are Standard deviations of bathymetric data and Coverage plot.
28. Power Supply	220V at 50 Hz
29. Post processing system	Two post-processing systems (one on board, one for laboratory use) with following capabilities: Data cleaning, DTM Generation, data thinning, grid generation and presentation graphics, CAD compatible output full system with hardware and peripherals like printer, Exabyte, DVD etc. should be provided. Data should be exportable in open data format and compatible to standard commercial/freeware (such as MB System) to carryout post processing.
30. Side Scan Image	At least 25000 samples per ping for side scan imagery should be possible. On post processing, geo referencing, mosaicing, image enhancement, bathymetry data draping and data output in XTF format should be available.
31. Seafloor classification	Software using side-scan data may be optionally quoted.

32. Angular Backscatter strength:	Parameters for backscatter strength computations like signal gain terms (transmission and reception)—the pre-amplifier gain, transducer matching circuit aspects, beam forming gain, band pass filter gain and time varied gain (TVG) employed within the system should be provided. Details about special normalization techniques: Lambert's law (employed, if any) should also be provided.
33. Backscatter Processing:	Software to compute near absolute backscatter strength vs. incidence angle (with all gain corrections), sea-floor slope corrections, and sea-floor ensonification area normalization. This may be optionally quoted.
34. Signal Synchronization	System should generate synchronization signal to control pinging of other onboard acoustic systems.
35. Positioning sensor	DGPS and 1 PPS signal interface to be provided.
36. Motion and Heading Sensors	IMO Certified survey grade gyro compass with complete motion sensor that outputs Roll, Pitch, Surge, Sway, Heave, Speed, Acceleration in addition to true heading. System should perform well in all sea conditions with 1 minute settling time, 0.1˚ Heading accuracy, 0.01˚ roll and pitch accuracy OR output from the motion sensor be used for deep sea MB system be coupled with this system.
37. Sound velocity at the keel	Suitable online system and integration facility should be quoted as an option OR output from the SVP sensor be used for deep sea MB system be coupled with this system.
38. Sound velocity profiler	Optionally to be quoted
39. Transducer Array Particulars	As explained above the transducer array should be flat type only
40. Water column Imaging	To acquire acoustic data from water column to correlate with biomass and related deep scattering layer (DSL) – may be optionally quoted.
41. Manuals, literature	4 copies of operators manual, servicing manual complete with circuit description, detailed circuit diagrams for each board and overall system, signal flow charts, fault finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided.
42. Dimension details	Please provide complete physical dimensional details of each unit covered under the scope of delivery. This should include length, breadth, height of each unit, weight of each unit, input A/C power rating for each unit and total power requirement for entire system.
43. System synchronization	The system to be suitable for external synchronization with other acoustic systems on board.
44. Place and time of Delivery	Place - ABG Shipyard, Surat, India.

	Delivery period – 16-18 weeks Delivery of the system is linked with the Shipyard requirements. Exact delivery date will be informed at the time of placement of the order.
45. Spares	Some of the minimum essential spares should be part of the equipment. List of such spares that will be part of delivery should be listed clearly. Other comprehensive list of spares required for 3 year operations to be quoted separately.
46. Manuals, literature	4 copies of operators manual, servicing manual complete with circuit description, detailed circuit diagrams for each board and overall system, signal flow charts, fault finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. This is a mandatory requirement.
47. Installation	During all stages of the installation at the yard the manufacturer's engineer will ensure proper installation procedures are followed by the yard. Manufacturer will provide all details needed for the installation at yard including scope of supply from the yard like necessary structural requirements like gland packing, pipes, different types of cables, cable terminations etc and shall ensure that all items as per requirements are supplied and used for installation of the equipment. Any LAN lines OR RS232 lines required during installation to be specified giving all details including type, size and lengths of such cables. This is also applicable to any other cables from transceiver room to Lab space, LAB space to all the repeater/ Helmsmen displays shown in the GA plan. GA plan will be a part of the tender document. The manufacturer to recommend for any change for appropriate location on the GA plan provided in the transducer location area to the locations shown by NIO in the GA plan.
48. Factory Acceptance Test (FAT)	Successful bidder will arrange for the FAT conducted in presences of NIO Engineer/Scientist prior to the shipment of the system for installation. Manufacturer shall demonstrate complete and satisfactory working of each module of all the sub-systems, related sensors and of the entire integrated system at their manufacturing premises during FAT. FAT is expected to be for duration 5 days to enable proper inspection of the system to be delivered.
49. Harbor Acceptance Test	On completion of the complete installation process, the manufacturer will conduct the Harbor acceptance test (HAT) of the system in presence of the owner's representatives. Manufacturer's representative present at the time of installation process to ensure that all due precautions are taken by the yard in providing all the material of the quality specified by the manufacturer in his

	yard's scope of supply. Any negligence or discrepancy on the part of yard during the course of installation process may be brought to the notice of owner's representatives at Yard.
50. Sea Acceptance Test	On completion of ship's construction by yard the manufacturer will conduct the Sea Acceptance Test (SAT) of the system and demonstrate working of the system as per the specifications and the agreed terms signed in an agreement document. The system will be accepted only after successful completion of sea trials and demonstration of the system capabilities. Any deviation in the performance of the equipment will be set right by the manufacturer within a period mutually agreed. Warranty of the system will start on completion of the acceptance of the sea trials.
51. Training to NIO Engineers and Scientist	An operation, maintenance, servicing training on the main system and complete post-processing procedures shall be provided by the manufacturer for period not less than 5 working weeks for at least 4 engineers/scientist of NIO at the manufacturer's premises. A comprehensive training programme schedule will be drawn by NIO in consultation with successful bidder.
52. Warranty	3 years comprehensive warranty

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5.	*Technical Specifications for Hull Mounted Parametric Sonar System*

The System is required to be installed onboard the Indian Research Vessel proposed new ORV for NIO and to be used for Parametric Sub-Bottom Profiler for geological & Geophysical surveys. The system should be capable of operating from shallow water to deepwater (~10000 m). The system should include position fixing by DGPS (satellite linked), motion sensors, heading sensor, sound velocity sensor (for near ship's-keel measurement), data acquisition system, post-processing system (hardware and software for onboard and shore installations), accessories and all related peripheral systems.

NOTE: Kindly note that some of the details sought in the technical specifications as mentioned below cannot be quantified in absolute numbers. Merit of a specific point in such cases will be considered based on complete and detailed explanation by the makers of the system and based on the advantages of their explanation of the technique over their competitors.

System Configuration

Depth range	Up to 11000 meters
1. Frequency Ranges Primary high-frequency range Parametric Low-frequency range Secondary High-frequency range	 Selectable between 15 to 33 KHz Selectable between 0.5 to 6 KHz Provide details if available in other band
2. Beam width	Beam width 4° to 5.5°
3. Beam steering angles	Specify beam steering capability along and across track. Should include this as part of the offer.
4. Side lobe suppression	Full, Should have no side lobes
5. Max. Penetration in meter and TWT	> 200 meters at 4000 to 5000 meters under suitable geological conditions
6. Ping rate	Specify for use in shallow and deep water
7. Multi-ping	Mutli-ping facility should be available
8. Transducer size // transducer weight with cable	Specify the size of array, its weight and suitability for flush mounting with hull.
9. Transmitter Source Level	240 dB re µP/m or better
10. Acoustic Range resolution	Better than 25 cm
11. Phase information of received signal	Phase information included in the raw data
12. Water Column data acquisition	Should be available
13. Possibility of use as conventional SBP	Should be possible to use as conventional SBP and to provide single beam data with high frequency component as an echogram.
14. Simultaneous multi window presentation	For Multiple sediment echograms & single trace windows, multiple frequency spectrograms, Multiple water column echograms
15.Pulse length	Should be at least 25 mS or better in selectable steps
16. Pulse type	Specify different types of output pulse modes.
17. Possible pulse shapes used for transmission	Specify type of windowing function possible for different pulse shapes and their advantages for sub-bottom data collection in different geological settings.
18. Multi beam operational capability	Should be able to use in multi beam mode.
19. Beam Stabilization: Roll Pitch Yaw	 System should use the data from Motion sensor to compensate for roll, pitch and yaw motions.
20. Heave compensation	Heave compensation to be included using data from existing motion sensor.
21. System Software: **Data Acquisition software** Multi user possibility Multi sonar system handling Data Storage **Data Processing software** Numerical data processing methods	Provide complete details of the Data acquisition and Post-processing software with their capabilities. • Output should be in digital ‘dB’ or volt level. • Under numerical data processing Low-pass filtering in the time domain, Fast

Graphic data processing methods Data Export formats	Fourier, Transformation (FFT), Correlation, Heave compensation, Deconvolution, Stacking etc. • In graphical processing mode processing Clipping, Threshold filtering, Negative flank suppression, Phase difference calculation, Saturation control of displayed phase differences etc. • State multi user possibility of the software if any and how it is implemented in the system. • Data export formats should provide IBM SEG Y format other than the manufacturer's own data format. • A large data storage device on a HDD (more than 500 GB) and a facility to make backup data storage should be available.
22. Data replay capability	Should be available.
23. Interface	Serial interface for ship motion data, gyro compass data, navigation data, surface sound velocity, sound velocity profile, interface for online gravity and magnetic data from existing system onboard. A LAN interface for data transfer and connectivity to ship's LAN system should be available.
24. Power Supply	230 Volts at 50Hz
25. System synchronization	The system to be suitable for external synchronization with other acoustic systems on board.
26. Spares	Some of the minimum essential spares should be part of the equipment. List of such spares that will be part of delivery should be listed clearly. Other comprehensive list of spares required for 3 year operations to be quoted separately.
27. Manuals, literature	4 copies of operators manual, servicing manual complete with circuit description, detailed circuit diagrams for each board and overall system, signal flow charts, fault finding flow charts, diagnostic flow charts to be provided, wiring details between different units to be provided. This is a mandatory requirement. If detailed circuit diagrams are not included in the service manual as explained above, a penalty will levied to the supplier, which will be part of the supply

	agreement document.
28. Dimension details	Please provide complete physical dimensional details of each unit covered under the scope of delivery. This should include length, breadth, height of each unit, weight of each unit, input A/C power rating for each unit and total power requirement for entire system.
29. Place and time of Delivery	Place - ABG Shipyard, Surat, India. Delivery period – 16-18 weeks Delivery of the system is linked with the Shipyard requirements. Exact delivery date will be informed at the time of placement of the order.
30. Installation	During all stages of the installation at the yard the manufacturer's engineer will ensure proper installation procedures are followed by the yard. Manufacturer will provide all details needed for the installation at yard including scope of supply from the yard like necessary structural requirements like gland packing, pipes, different types of cables, cable terminations etc and shall ensure that all items as per requirements are supplied and used for installation of the equipment. Any LAN lines OR RS232 lines required during installation to be specified giving all details including type, size and lengths of such cables. This is also applicable to any other cables from transceiver room to Lab space, Lab space to all the repeater/ Helmsmen displays shown in the GA plan. GA plan will be a part of the tender document. The manufacturer to recommend for any change for appropriate location on the GA plan provided in the transducer location area to the locations shown by NIO in the GA plan.
31. Factory Acceptance Test (FAT)	Successful bidder will arrange for the FAT conducted in presences of NIO Engineer/Scientist prior to the shipment of the system for installation. Manufacturer shall demonstrate complete and satisfactory working of each module of all the sub-systems, related sensors and of the entire integrated system at their manufacturing premises during FAT. FAT is expected to be for a duration 5 days to enable proper inspection of the system to be delivered.
32. Harbor Acceptance Test (HAT)	On completion of the complete installation process, the manufacturer will conduct the

	Harbor acceptance test (HAT) of the system in presence of the owner's representatives. Manufacturer's representative present at the time of installation process to ensure that all due precautions are taken by the yard in providing all the material of the quality specified by the manufacturer in his yard's scope of supply. Any negligence or discrepancy on the part of yard during the course of installation process may be brought to the notice of owner's representatives at Yard.
33. Sea Acceptance Test (SAT)	On completion of ship's construction by yard the manufacturer will conduct the Sea Acceptance Test (SAT) of the system and demonstrate working of the system as per the specifications and the agreed terms signed in an agreement document. The system will be accepted only after successful completion of sea trials and demonstration of the system capabilities. Any deviation in the performance of the equipment will be set right by the manufacturer within a period mutually agreed. Warranty of the system will start on completion of the acceptance of the sea trials.
34. Training to NIO Engineers and Scientist	An operation, maintenance, servicing training on the main system and complete post-processing procedures shall be provided by the manufacturer for period not less than 5 working weeks for 4 NIO engineers/scientists at the manufacturer's premises. A comprehensive training programme schedule will be drawn by NIO in consultation with successful bidder.
35. Warranty	3 years comprehensive warranty

PART-B

TERMS & CONDITIONS

1. Tenderers must submit their quotations in the prescribed format only. Please refer to detailed terms & conditions on pages 35 & 36 of special conditions of contract (SCC).
2. **All terms & conditions and other instructions are applicable for the bidders. Refer to nio Website www.nio.org under "Tenders".**

3. Preparation of Bids:

Sealed bids in two envelopes are to be submitted as following:

a. **Technical Bid:** First Envelope namely Technical Bid should contain only technical specification. This envelope should also contain EMD. No commercial information that may have any financial implication will be mentioned there. This cover should be superscribed technical bid for ,Supply, Installation & Commissioning, testing support services, and maintenance of the **ACCOUSTIC SYSTEMS FOR ORV SINDHU SADHANA.**

b. **Commercial Bid:** Second envelope namely commercial Bid will be verbatim the same as technical Bid, but it also contains the financial terms & Conditions. This cover should be super scribed commercial bid for Supply , installation and commissioning of **ACCOUSTIC SYSTEMS FOR ORV SINDHU SADHANA.**

However, both the envelopes should be kept in a common envelope and superscribed ,Quotation for 'Supply, installation and Commissioning of **ACCOUSTIC SYSTEMS FOR ORV SINDHU SADHANA.** against tender enquiry **No. IMP/ORV-AAS/EQ/2010** and due date on **01/12/2010** . This cover should be addressed to The Director, NIO, Dona-Paula, Goa, India and Kind Attention : **Stores & Purchase Officer.**

4. The Bids complete in all respects and duly signed and sealed should reach office of The Director, NIO, Dona-Paula, Goa, India and Kind Attention : **Stores & Purchase Officer,** latest by **05.00** PM on or before **30/11/2010** . This office will not be responsible for any postal/ courier delays.

5. Late / delay Quotation received after due date will be rejected summarily.

6. Fax/e-mail tenders will not be considered.

7. Only Technical Bids will be opened on **01/12/2010** at **3.00 PM** . Commercial Bid will be opened only of those Tenderers whose Technical Bids will be found suitable by us. The date and timing of opening of Commercial Bids will be communicated to the successful bidders of their technical quote.

8. Commercial Bid should contain the following details:

A. For goods manufactured abroad:

i) FOB value including packing, forwarding and inland freight charges up to Gateway International Air Port.

ii) Please quote separately for CIF Mumbai value by air freight.

iii) Please indicate the import code of the item in the quotation.

iv) Percentage & amount of Indian agency commission payable in Indian currency after the receipt of consignment in good condition at our Stores & in case of equipment after satisfactory installation, commissioning and acceptance.

v) All foreign bank charges shall be borne by the supplier.
vi) The offer should be valid for 120 days from the last date for receipt of Tender.

B. For Goods Manufactured within India.

(i) The price of the goods quoted ex works should include all duties & Taxes already paid.
(ii) The Percentage of Vat & other Taxes like Excise Duty, Service Tax which will be payable on the goods should be indicated.
(iii) The cost of inland transport, insurance, and other local services for delivery of the goods at ABG Shipyard, Surat-India should be indicated.

9. Earnest Money Deposit:

a) The Earnest Money Deposit of **Rs. 25,00,000/- (Rupees twenty five lakhs only)** should be in the form of Demand Draft/International Demand Draft as the case may be from a Scheduled or Nationalized Bank drawn in favour of The Director, NIO payable at Panjim / Dona-Paula, Goa.
b) The Earnest Money of Successful Bidder on whom order is placed, will be returned after the supply, Successful installation, commissioning training and acceptance of the ordered item.
c) The Earnest Money of Unsuccessful bidder will be returned immediately after placement of order on the successful Bidder.
d) The Earnest Money of the successful bidder can be forfeited for non-execution of the order within the delivery period or on delay in executing the order or on unsatisfactory supply of the ordered item or providing unsatisfactory services.
e) Bid without valid EMD will be rejected.
f) No interest will be paid on EMD.

10. The principal manufacturer only should submit the quotation and should be fully equipped to render us after sale service during warranty and thereafter for all the equipments supplied.

11. Negotiation with bidders after the opening of the quotations is severely discouraged. Therefore, the bidders are advised in their own interest to quote their best competitive offer in the first instance or maximum discount may be indicated in the quote/offer. However, Director, NIO reserves the right for a techno commercial discussion.

12. Indicate the names of the Indian reputed Organizations where you have supplied the similar equipment and may attach the satisfactory performance report of the equipment from users.

13. If supplied identical or similar equipment to other CSIR/Labs/Inst., the details of

such supplies for the preceding three years should be given together with the prices eventually or finally paid.

14. Details of services to be rendered by Manufacturers should be indicated in the technical quote.

15. Delivery period should be clearly indicated.

16. Details Terms including period of warranty (A minimum three years onsite warranty is required).

17. Please do confirm that service manual will be supplied along with the supply of material.

18. Installation, Commissioning and satisfactory Demonstration of the whole System and Training should be as stipulated in the document.

19. Part shipment will normally not be allowed.

20. The Installation, Commissioning and Demonstration of the system should be completed within stipulated time from the date of arrival of the items **at ABG Shipyard, Surat, INDIA.**

21. Kindly indicate the approximate dimensions & weight of the stores/consignment:
(a) Measurement
(b) Tare Weight
(c) Net Weight

22. Customs clearance will be arranged by our Clearing Agent whose address will be communicated while placing Order.

23. We prefer to release the payment on BILL basis (excluding) Indian Agency Commission) after the receipt of consignment in good condition. Alternatively, depending upon the value and foreign exchange regulations the payment can also be considered through Letter of Credit through the State Bank of India, Dona-Paula Branch , Goa or any other authorized bank for the order value excluding the Indian Agency Commission.

Stores & Purchase Officer

PART – C
SPECIAL TERMS & CONDITIONS

(1) **IMPORT LICENSE**: The import license is covered under Export & Import Policy 2009-2014 under chapter V Para II. In case of any imports restrictions, the same should be informed to the buyers well in advance.

(2) Custom Duty: Procurement is as per Registration No. TU/V/RG-CDE (130)/2006 dated 15-09-2006 of Department of Science & Technology (Ministry of Science & Technology, Government of India) and also Custom Duty Exemption in terms of Government of India Notification No.51/96- Customs dated 23-07-96 for import of stores from abroad without an import license.

(3) The price of the items should be on FOB gateway airport. Freight and Insurance should also be quoted and the price should indicate separately **CIF Mumbai**.

(4) Agency commission should be clearly specified.

(5) NIO has its own freight forwarding & customs clearing agents.

(6) TAXES/LEVIES: All taxes, duties, levies of any kind payable in abroad if any shall be borne by the supplier.
(7) **PAYMENT:** 80% payment shall be made by Sight Draft/an Irrevocable Letter of Credit established in favour of the supplier through "State Bank of India, Dona-Paula Branch, Goa or any other authorized bank for the order value, excluding the Agency Commission due to the Agents after supply, installation & commissioning in house training to staff and satisfactory acceptance of the item. Balance 20% will be released after satisfactory acceptance and receipt of Bank Guarantee for 20% of total order value either from Principal or from their Agent towards performance security to be valid for warranty period plus two months grace period from the date of installation and acceptance. The value 20% will base on the exchange value at the time of release of 80% payment or on the date of release of 20% whichever is lower**.** However, L/C will be opened for the full amount.

(8) The payment of local currency portion shall be payable in equivalent Indian rupees, within 30 days after acceptance of the items and also compliance of all Terms & Conditions of our order related to it.

(9) The make/brand and name and address of the manufacturer, Country of Origin, copies of the relevant technical literature, Country of shipment and currency in which rates are quoted are to be mentioned.

(10) For Indigenous supply :

a) The quote should be FOR NIO at the stipulated destination in India i.e. inclusive of packing & forwarding, freight, insurance charges (if any break-up prices may be indicated) otherwise the quote may not be considered for evaluation.

b) Excise Duty: please note this Institute is exempted from payment of Central

Excise duty in terms of Government Notification No. 10/97-Central Excise Dated 01.03.97. Hence, quote accordingly.

c) The rate of VAT/Service Tax if applicable must be indicated clearly. This office is not eligible to issue form 'C' or 'D'.

d) Payment in Indian Rupees: 80% payment will be made on supply, installation and in-house training of staff & its satisfactory acceptance of the item in NIO Campus and balance on submission of 20% performance Bank Guarantee for total order value valid till warranty period with additional 2 months grace period.

(11) **Delivery Period:** ‚Time is the essence'. Normally the delivery period is 16-18 weeks from the date of issue of purchase order. Delivery period should be clearly indicated.

(12) **Warranty period:** Normal warranty period is **THREE** years comprehensive from the date of supply, installation & commissioning, demonstration and its satisfactory acceptance. This must be specified clearly in technical bid.

(13) MANUALS: Instruction manuals for operation and maintenance wherever applicable should be supplied along with the equipment as stipulated in the tender document.

(14) SERVICE: Bidder shall be responsible for after-sales service during the warranty period and thereafter. The after-sales service to be rendered by the bidder during the warranty and thereafter should be made clear in the technical bid. The after sales service is an essential requirement to us.

(15) Bidders have to confirm that all essential spare parts of the quoted system shall be available for a minimum period of 10 years from the date of supply of the equipment in the technical bid.

(16) Bidder should submit valid documentary proof of Sales Tax/VAT/Service tax.
(17) The tenders will be received in the office of the The Director, NIO, Dona-Paula, Goa, India and Kind Attention : **Stores & Purchase Officer,** up to **30/11/2010** at **5.00 PM** and shall be opened at **3.00 PM** on **01/12/2010** in the presence of the tenderer's or their authorized agents who wish to be present.

(18) The copies of the relevant technical literature should accompany the tender.

(19) The equipment is to be guaranteed for trouble free performance for a minimum period of three years after installation. The defects, if any, during the guaranteed period are to be rectified free of charge by arranging free replacement wherever necessary.

(20) Discount offered should be mentioned clearly.

(21) If already you have supplied the quoted Equipment to other reputed Indian Organizations (Government/Reputed Private Organizations) with special reference to Labs/Institute of CSIR, New Delhi then complete postal addresses of such Organizations should be given in the offer along with Telephone number, Fax number and e-mail address along with the Name and designation of the contact person there.

(22) As far as possible please submit the offer against Air Freight only.

(23) All disputes subject to Goa (India) jurisdiction only.

(24) The Director, National Institute of Oceanography , Goa reserves the right to accept any tender in full or in part or to reject the lowest or any or all tenders without assigning any reason.

Stores & Purchase officer

PART - D

CHECK LISTS & CRITICAL DATES

Before submitting your quotations please confirm the followings :

DO's	DON'TS
1. Send Quotations in 2 parts – Technical Bid & Commercial Bid in separate covers.	**1. Over Write or Correction.**
2. Superscribe in the outer cover "Tender for _____ _____" and Tender Enquiry No._____ _____ due on _____	**2. Do not combine Commercial and Technical Bids.**
3. DD for EMD amount of Rs.	**3. Fax, Telex or E-mail quotes.**
4. Separate Tender for each category.	**1. Quotation after due date & time (5.00 pm).**
5. Technical Literature / pamphlet should be enclosed along with the Technical Bid.	
6. Enclosed list of clients / customers	
7. Enclose authorization letter in case representing their principals	
8. Endorse your signature in the Tender.	